Device for Fixing an Object to a Tree

The present invention relates to fixing an object to a tree.

Fixing objects to trees can cause damage. This is particularly the case when several fixtures have to be made, for example cable clips for when a lightning protection system. Conventionally, plastic or metal nails or screws are used for this purpose. However, as the tree grows these and the cable clips can become fully embedded in the tree and cause disfigurement. This is particularly a problem for rare or "veteran" trees which are of scientific or historical value.

According to one aspect of the present invention there is provided a device for fixing an object to a tree, the device including:

an elongate body, one end of which is adapted for attachment to a tree, in use an object being slidably mounted on the elongate body, and

a device for biasing an object slidably mounted on the elongate body towards the end of the body adapted for attachment to the tree,

in use, pressure resulting from growth of the tree being transmitted to the object and pushing it along the elongate body against the bias and away from the tree.

The inventor has found that using such a device that means that it is possible to reduce the risk of the object becoming embedded within the tree. Although parts of the device such as the elongate body may become embedded, these tend to be relatively small and/or cylindrical in shape and so cause less disfigurement of the tree. The elongate body may be adapted for attachment to a tree by being fitted with a fixing member. The fixing member may taper to a sharp end point. The fixing member can be provided with a screw thread for

helping insert it into the tree and keep it in place.

The biasing device may apply pressure that is usually slightly lower than that pressure resulting from expansion of a growing tree, e.g. 7 - 8 kg/cm^2. The biasing device may be formed of a resilient material. In one embodiment the biasing device comprises a compression spring.

One end of the biasing device may abut the object. Alternatively, a component, such as a washer or a ring, may be slidably mounted on the elongate body between the object and the tree so that the tree at least partially contacts the component, which transmits the pressure to the object.

The elongate body may be comprised of a plurality of elongate members, each of which may be generally cylindrical and/or have a smooth surface. The plurality of elongate members may be connected together by means of corresponding threaded projections and bores. The length of the elongate body can therefore be extended by inserting further elongate members.

Some or all of the components forming the device may be formed of plastics or metal, such as stainless steel. The object may be part of a lightning protection system for the tree, e.g. a cable clip.

According to another aspect of the present invention there is provided a device for fixing an object to a tree, the device including:

an elongate body, one end of which is adapted for attachment to a tree;

an object slidably mounted on the elongate body, and

a device for biasing the object towards the end of the body adapted for attachment to the tree,

in use, pressure resulting from growth of the tree being transmitted to the

object and pushing it along the elongate body against the bias and away from the tree.

According to yet another aspect of the invention there is provided a lightning protection system for a tree including a device substantially as described herein.

Whilst the invention has been described above, it extends to any inventive combination of the features set out above or in the following description.

The invention may be performed in various ways, and, by way of example only, an embodiment thereof will now be described, reference being made to the accompanying drawings, in which:-

Figure 1 is an exploded diagram of an embodiment of the device;

Figure 2 illustrates schematically the device in use.

The device is generally indicated at 10 in Figure 1. The device 10 includes four main components 12, 14, 16, and 18 which make up an elongate body. The screw-like component 12 located at one end of the elongate body acts as a fixing member. The component 12 has a head portion 13A leading to a tapering portion 13 that in turn leads to a sharp pointed end. The tapering portion 13 is provided with a screw thread. Within the free end of the head portion 13A there is a threaded blind bore. In an alternative embodiment, the fixing portion 12 may include separate head and thread portions.

The device 10 has a central portion which, in the example, is formed of two substantially cylindrical components 14, 16 that have smooth curved outer surfaces. A threaded projection extending from one end of the cylindrical

component 14 fits into the blind bore of the fixing component 12. The other end of the cylindrical component 14 includes a threaded blind bore 15A. The component 16 is substantially identical to the component 12 and has a threaded projection 17 which is used to connect it to the bore 15A of the component 14.

The other end of the component 16 has a blind bore 17A. It will be appreciated that further components such as the components 14 or 16 can be used to extend the overall length of the device 10. It will also be understood that the components making up the central portion need not be identical in length. Alternative means of attaching the components together can be used, e.g. adhesives or clips.

When the device is assembled the components 12, 14, 16 will usually be screwed together first. Optionally, a washer 20 is then be slipped onto the elongate body formed by the components, the washer abutting the head 13A of the fixing component 12, which helps prevent it from sliping onto the tapering portion 12. An object to be fixed to the tree, such as cable clip 24, can then be threaded onto the device so that it abuts the washer 20 (if fitted). The cable clip 24 has a central aperture of a diameter substantially similar to that of the cylindrical components 14, 16. This type of clip is particularly suitable for use with the device, but it will be appreciated that the object could be any suitable body that needs to be fixed to a tree.

A compression spring 22 is then fitted over the cylindrical components 14, 16 to encircle them. A first end of the spring 22 abuts the cable clip 24. The spring 22 has a diameter slightly greater than that of the central cylindrical portions of the device so that it can easily be compressed/uncompressed.

The final stage of assembling the device 10 normally involves screwing an end piece 18 into the bore 17A of the component 16. The end piece 18 can be a nut having a threaded projection 19 and a head portion 19A having a diameter greater than that of the cylindrical components 14, 16. A second optional washer 19B can be fitted between the head portion 19A and the cylindrical component 16. If this is done then a second end of the spring 22 will normally abut the washer 19B instead of the head 19A.

Turning to Figure 2, the device is shown fixing the cable clip 24 to a tree 32. The threaded portion 13 and possibly part of the head portion 13A is screwed/pushed into the side of the tree. Thus, the device 10 can project outwards from the side of the tree at an angle of around 90°. The bias provided by the spring 22 helps retain the clip 24 adjacent the outer surface of the tree 32. Thus, in the case of an object that is not threaded onto the device 10, pressure from the spring can retain it on the body of the device during normal use. In an alternative embodiment, a tube of resilient material or a plurality of springs may be used to provide the bias on the object.

A growing tree will typically exert an outward pressure of around 8.44 kg/cm^2 (120 psi). The spring 22 is selected so that it can exert a pressure slightly lower, e.g. 10%, than this so that is does not substantially inhibit the growth of the tree. Typically the pressure exerted by the spring may be in the range of 7 - 8 kg/cm^2. As the tree grows, the washer 20 and the clip 24 are pushed against the bias of the spring 22 towards the end piece 18 of the device 10, which can help prevent the clip 24 at least from becoming embedded in the tree.

A version of the device tested by the inventor includes cylindrical components 14, 16 which provide a total length of around 8 cms and a diameter of around 7 mm. The device further comprises a compression spring of around 56 mm in length in its uncompressed state and a diameter of around 10 mm. These components are estimated to prevent the clip from being embedded by the tree for around five years after it has been fitted. Thus, the device may not need any modifications or attention over this period.

The tree may eventually grow to a size which would mean that the clip 24 is in danger of being embedded or causing damage to the tree or the device is at risk of failing. At this point the end piece 18 of the device can be removed and a further smooth cylindrical portion can be fitted. It may also be necessary or desirable to replace the spring 22 with another one having different dimensions to exert a pressure of a different magnitude. The end piece 18 is then replaced so that pressure is again exerted on the clip 24.

The embodiments described above can be produced at low cost. The components are typically formed of durable materials such as plastic or metal, e.g. 316 stainless steel, which are intended to damage the tree as little as possible if they become embedded. The device can therefore provide a cheap and reliable way of attaching an object to a tree whilst reducing the risk of damage.